

Draft

MEPA/NEPA/HB495 GENERIC CHECKLIST

PART I. PROPOSED ACTION DESCRIPTION

1. **Type of Proposed State Action:** Pond Rehabilitation Using Rotenone
2. **Agency Authority for the Proposed Action:** MCA 87-1-201
3. **Name of Project:** Brown Trout Pond Rehabilitation
4. **Name, Address and Phone Number of Project sponsor (if other than the agency):** Fisheries Biologist Mark Deleray
MT Fish, Wildlife & Parks
490 N Meridian Road, Kalispell, MT 59901
5. **If Applicable:**

Estimated Construction/Commencement Date: Aug-Nov 2001
Estimated Completion Date: November 2001
Current Status of Project Design (% complete): 100%
6. **Location Affected by Proposed Action (county, range and township):**

T 29 N, R 21 W, S 35, in Flathead County
7. **Project Size (Estimate the number of acres that would be directly affected that are currently):**

(a) Developed: residential _ acres industrial _ acres	(d) Floodplain _ acres surface 4.3 acres
(b) Open Space/Woodlands/ Recreation _ acres	(e) Productive: irrigated cropland _ acres dry cropland _ acres forestry _ acres rangeland _ acres other _ acres
(c) Wetlands/Riparian Areas _ acres	

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8. **Map/site plan:** attach an original 8 1/2" x 11" or larger section of the most recent USGS 7.5' series topographic map showing the location and boundaries of the area that would be affected by the proposed action. A different map scale may be substituted if more appropriate or if required by agency rule. If available, a site plan should also be attached.
9. **Narrative Summary of the Proposed Action or Project Including the Benefits and Purpose of the Proposed Action:** In July 2000, MFWP personnel discovered a reproducing population of nonnative brown trout inhabiting three ponds (gravel pits) near the Flathead River. This is only the second time brown trout have been verified in the Flathead drainage upstream from Kerr Dam; the first population is being removed at this time. Brown trout directly compete with bull trout (ESA listed species) for spawning, rearing, and food and space resources. The purpose of this project is to eradicate the illegally introduced population of brown trout from the ponds to minimize potential threats to native species in the Flathead River drainage. Failure to immediately eradicate this population may result in brown trout colonizing other areas of the river/lake system, possibly reducing the abundance and distribution of native fishes. This action is consistent with the Governor's Bull Trout Restoration Team recommendation for removal or suppression of introduced fish to aid in bull trout recovery.
10. **Listing of any other Local, State or Federal agency that has overlapping or additional jurisdiction:**
- (a) Permits:
- | <u>Agency Name</u> | <u>Permit</u> | <u>Date Filed/#</u> |
|-----------------------------------|---------------|-----------------------------------------------------------------|
| MT Dept. of Environmental Quality | 308 | Application will be filed following completion of MEPA process. |
- (b) Funding:
- | <u>Agency Name</u> | <u>Funding Amount</u> |
|--------------------|-----------------------|
| N/A | |
- (c) Other Overlapping or Additional Jurisdictional Responsibilities:
- | <u>Agency Name</u> | <u>Type of Responsibility</u> |
|--------------------|-------------------------------|
| N/A | |
11. **List of Agencies Consulted During Preparation of the EA:**
- MT Dept. of Environmental Quality

PART II. ENVIRONMENTAL REVIEW

A. Evaluation of the Impacts of the Proposed Action Including Secondary and Cumulative Impacts on the Physical and Human Environment:

PHYSICAL ENVIRONMENT

1. <u>LAND RESOURCES</u> Will the proposed action result in:	IMPACTS				Can Impacts Be Mitigated*	Comment Index
	Unknown*	None	Minor*	Potentially Significant*		
a. Soil instability or changes in geologic substructure?		X				
b. Disruption, displacement, erosion, compaction, moisture loss, or over-covering of soil which would reduce productivity or fertility?		X				
c. Destruction, covering, or modification of any unique geologic or physical features?		X				
d. Changes in siltation, deposition, or erosion patterns that may modify the channel of a river or stream or the bed or shore of a lake?		X				
e. Other:						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

PHYSICAL ENVIRONMENT (continued)

2. <u>AIR</u> Will the proposed action result in:	IMPACTS				Can Impacts Be Mitigated*	Comment Index
	Unknown*	None	Minor*	Potentially Significant*		
a. Emission of air pollutants or deterioration of ambient air quality?		X				
b. Creation of objectionable odors?			X		No	2b
c. Alteration of air movement, moisture or temperature patterns, or any change in climate, either locally or regionally?		X				
d. Adverse effects on vegetation, including crops, due to increased emissions of pollutants?		X				
e. Other:						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Air Resources (Attach additional pages of narrative if needed):

2b. The petroleum-based carrier in the toxicant has an odor. Following application, this odor will be detectable in the near vicinity. It will dissipate in a matter of days.

*Include an attachment with a narrative explanation describing the scope and level of impact. If the impact is unknown, explain why the unknown impact has not or cannot be evaluated.

PHYSICAL ENVIRONMENT (continued)

3. <u>WATER</u> Will the proposed action result in:	IMPACTS				Can Impacts Be Mitigated*	Comment Index
	Unknown*	None	Minor*	Potentially Significant*		
a. Discharge into surface water or any alteration of surface water quality, including but not limited to temperature, dissolved oxygen, turbidity, or pathogens?			X		Yes	3a
b. Changes in drainage patterns or the rate and amount of surface runoff?		X				
c. Alteration of the course or magnitude of flood water or other flows?		X				
d. Changes in the amount of surface water in any water body or creation of a new water body?		X				
e. Exposure of people or property to water related hazards such as flooding?		X				
f. Changes in the quality of groundwater?		X				3f
g. Changes in the quantity of groundwater?		X				
h. Increase in the risk of contamination of surface or groundwater?			X		Yes	3a and 3f
i. Violation of the Montana Nondegradation Statute?		X				
j. Effects on any existing water right or reservation?		X				
k. Effects on other water users as a result of any alteration in surface or groundwater quality?		X				
l. Effects on other users as a result of any alteration in surface or groundwater quantity?			X		Yes	3l
m. Other:						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Air Resources (Attach additional pages of narrative if needed):

3a. There are no inlets or outlets from the ponds. This will eliminate any potential for the rotenone-treated water from being released into other surface waters.

The concentration of rotenone (2ppm of a 5% rotenone formulation, or 0.1 ppm rotenone) which will be used in this project will not be harmful to plants, most invertebrate populations, adult amphibians, reptiles, birds, or mammals, including humans, from exposure to treated water, drinking of treated water, or ingestion of treated fish.

Rotenone is a naturally occurring substance derived from the roots of several tropical and subtropical plants in the bean family, Leguminosae, including jewel vine or Flame tree (*Derris* spp.) and lacepod (*Lonchocarpus* spp.) or hoary pea (*Tephrosia* spp.) (Finlayson et al. 2000). We plan to use a liquid formulation that was extracted from the roots. Rotenone inhibits a biochemical process at the cellular level, which makes it impossible for the fish to use oxygen absorbed in the blood and needed in the release of energy during respiration (Oberg 1967a, 1967b).

Rotenone has only a minor potential impact on the water quality for several reasons. The hazard associated with drinking water containing rotenone is very small because of the low concentration of rotenone (0.1 ppm) used in the treatment and the rapid breakdown and dilution of rotenone. The time for natural degradation (neutralization) of rotenone is controlled primarily by temperature. Rotenone acts and degrades faster in warmer water (Horton 1991). In California, studies have shown that rotenone completely degrades within 1-8 weeks within the temperature range of 50-68F (10-20C) (CDFG 1994; Siepmann and Finlayson 1999). The estimated half-life of rotenone in California waters are 7.8-15 days at the respective temperatures just mentioned (Finlayson et al. 2000). Other studies have shown half-life values of 13.9 hours to 10.3 days for water temperatures of 75F and 41F (24C and 5C) (Gilderhus et al. 1986, 1988).

To reduce the potential risks associated with the use of rotenone, the following mitigation measures and monitoring efforts will be employed:

1. Project personnel will be trained in the use of these chemicals including the actions necessary to deal with spills; personnel will wear rubber gloves and safety goggles.
2. Only the amount of rotenone that is needed for immediate use will be held near the ponds.
3. Prior to the use of rotenone, local landowners will be notified.

3f. Changes in groundwater quality: The risk that rotenone will enter and be mobile in groundwater is minimal. Rotenone's ability to move through soil is low to slight (Finlayson et al. 2000). Rotenone moves less than 1 inch in most types of soils, except for sandy soils where the movement is slightly more than 3 inches. Rotenone is strongly bound to organic matter in soil, so it is unlikely that rotenone would enter the groundwater (Dawson et al. 1991). Rotenone can be found in lake sediments at similar concentrations as in water; its breakdown lags behind that of water by 1-2 weeks (Finlayson et al. 2000). However, even if groundwater contamination could occur, there would be a low potential for detrimental effects on human health, since the surface water concentrations to be used in this project have been shown to have no toxic effect on humans or other animals (see 8a). Furthermore, any rotenone that enters groundwater will continue to be diluted by water already present in the aquifer.

3i. Effects on other water users: Bioassays on mammals suggest that at the proposed concentrations of rotenone that will be used, it would have no effect on mammals that drink the treated water. There is no reason to restrict the use of rotenone in waters intended for irrigation, livestock consumption (except possibly for swine), and recreational swimming use (USEPA 1981b). Although the studies required for setting tolerances have been completed, the USEPA has not established tolerances for rotenone in potable and irrigation water. As a result, although waters with rotenone present may not cause problems, water containing residues of rotenone cannot be legally allowed for use for domestic or crop use. The degradation process can vary from 1-8 weeks depending on initial concentrations, temperature, and water chemistry. This is not a concern since the ponds are not used for domestic purposes or livestock. Also, the waters have no direct public access.

There will be a temporary loss of fishery during rehabilitation period. Owner will be allowed to restock ponds following completion of and compliance with proper permitting within months of treatment.

PHYSICAL ENVIRONMENT (continued)

4. <u>VEGETATION</u> Will the proposed action result in:	IMPACT				Can Impacts Be Mitigated*	Comme. Index
	Unknown*	None	Minor*	Potentially Significant*		
a. Changes in the diversity, productivity, or abundance of plant species (including trees, shrubs, grass, crops, and aquatic plants)?		X				
b. Alteration of a plant community?		X				
c. Adverse effects on any unique, rare, threatened, or endangered plant species?		X				
d. Reduction in acreage or productivity of any agricultural land?		X				
e. Establishment or spread of noxious weeds?		X				
f. Other:						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Vegetation Resources (Attach additional pages of narrative if needed):

*Include an attachment with a narrative explanation describing the scope and ⁵level of impact. If the impact is unknown, explain why the unknown impact has not or cannot be evaluated.

PHYSICAL ENVIRONMENT (continued)

5. <u>FISH/WILDLIFE</u> Will the proposed action result in:	IMPACT				Can Impact Be Mitigated*	Comment Index
	Unknown*	None	Minor*	Potentially Significant*		
a. Deterioration of critical fish or wildlife habitat?		X				
b. Changes in the diversity or abundance of game animals or bird species?			X		X	5b
c. Changes in the diversity or abundance of nongame species?			X		X	5c
d. Introduction of new species into an area?		X				
e. Creation of a barrier to the migration or movement of animals?		X				
f. Adverse effects on any unique, rare, threatened, or endangered species?		X				
g. Increase in conditions that stress wildlife populations or limit abundance (including harassment, legal, or illegal harvest, or other human activity)?		X				
h. Other:						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

5b. This proposed action is intended to result in removal of nonnative brown and rainbow trout from three small ponds. The project's goal is to increase the security of native trout in the drainage.

5c. Rotenone has a minimal impact on nontarget species. Rotenone has some toxicity to all oxygen-breathing animals, but at the concentrations we will use, it is selective to fish and gill-breathing organisms. Most common aquatic invertebrates are less sensitive to rotenone than fish. Some zooplankton, such as cladocerans and copepods are just as sensitive as fish, but have life history stages that will survive the treatment. The effect on invertebrates may include a temporary decrease in populations of certain taxa. Snails and clams are tolerant. All animals, including fish, insects, birds, and mammals have natural enzymes in the digestive tract that neutralize rotenone, and the gastrointestinal absorption is inefficient. Fish, some amphibians, and aquatic invertebrates are more susceptible because rotenone is absorbed directly into their blood through their gills, bypassing the digestive enzymes that would neutralize it. Rotenone residues in dead fish are generally very low, <0.1 ppm, unstable like those in water, and not readily absorbed through the gut of the animal eating the fish. Birds and mammals that eat the dead fish and drink treated water should not be affected. A bird weighing 0.25 pounds would have to consume 100 quarts of water or more than 40 pounds of fish within 24 hours to receive a lethal dose. The 0.25-pound bird normally consumes 0.2 ounces of water and 0.32 ounces of food daily; a safety factor of 1,000 to 10,000-fold exists for birds and mammals (Finlayson et al. 2000). No latent or continuing toxicity is expected for more than a few weeks (CDFG 1994). Livestock are subjected to low risks as a result of this proposal. Rotenone was used for many years to control grubs on the backs of dairy and beef cattle. The USEPA (1981b) has stated that there is no need to restrict livestock consumption of treated waters. However, swine are more sensitive than cattle (Thompson 1985). Most dead fish will sink to the bottom of the treated water in several days, decompose, and release nutrients back into the water. The nutrients will enhance phytoplankton and insect and zooplankton production, which provide the food base for fish planted in the future.

HUMAN ENVIRONMENT

6. <u>NOISE/ELECTRICAL EFFECTS</u> Will the proposed action result in:	IMPACT				Can Impact Be Mitigated*	Comment Index
	Unknown*	None	Minor*	Potentially Significant*		
a. Increases in existing noise levels?		X				
b. Exposure of people to serve or nuisance noise levels?		X				
c. Creation of electrostatic or electromagnetic effects that could be detrimental to human health or property?		X				
d. Interference with radio or television reception and operation?		X				
e. Other:						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

HUMAN ENVIRONMENT (continued)

7. <u>LAND USE</u> Will the proposed action result in:	IMPACT				Can Impact Be Mitigated*	Comment Index
	Unknown*	None	Minor*	Potentially Significant*		
a. Alteration of or interference with the productivity or profitability of the existing land use of an area?		X				
b. Conflicted with a designated natural area or area of unusual scientific or educational importance?		X				
c. Conflict with any existing land use whose presence would constrain or potentially prohibit the proposed action?		X				
d. Adverse effects on or relocation of residences?		X				
e. Other:						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

8. <u>RISK/HEALTH HAZARDS</u> Will the proposed action result in:	IMPACT				Can Impact Be Mitigated*	Comment Index
	Unknown*	None	Minor*	Potentially Significant*		
a. Risk of an explosion or release of hazardous substances (including, but not limited to oil, pesticides, chemicals, or radiation) in the event of an accident or other forms of disruption?			X		Yes	8a
b. Affect an existing emergency response or emergency evacuation plan or create a need for a new plan?		X				
c. Creation of any human health hazard or potential hazard?			X		Yes	8a
d. Other: Will chemical toxicants be used?			X		Yes	8a

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

8a. Substantial research has been conducted to determine the safety of rotenone. From this research it has been concluded that rotenone does not cause birth defects (Hazleton Raltech Laboratories 1982), reproductive dysfunction (Spencer and Sing 1982), gene mutation (Biotech Research 1981; Geothem et al. 1981; NAS 1983), or cancer (USEPA 1981b, Tisdell 1985). When used according to label instructions for the control of fish, rotenone poses little, if any, hazard to public health. The USEPA (1981b, 1989b) has concluded that the use of rotenone for fish control does not present a risk of unreasonable adverse effects to humans and the environment.

The hazard associated with the short-term exposure to drinking water containing rotenone is very small because of the low concentration of rotenone (0.1 ppm) used in the treatment and the rapid breakdown and dilution of rotenone. Estimates of a single lethal dose to humans are 300-500 mg of rotenone per kilogram (2.2 pounds) of body weight (Gleason et al. 1969). For example, a 160 pound (72.6 kilogram) person would have to drink over 23,000 gallons (87,000 liters) of water treated at 0.25 mg of rotenone per liter of water at one sitting; 0.25 mg of rotenone per liter of water is the highest allowable treatment rate for fish management. A 22 pound (10 kilogram) child would have to drink over 1,429 gallons (5,400 liters). An intake of 0.7 mg of rotenone per kilogram of body weight per day is considered safe (Haley 1978), which is equivalent to about 25 mg/L when consumed as drinking water; this concentration is far greater than the expected exposure resulting from the maximum fish management treatment rate of 0.25 mg of rotenone per liter of water or our proposed concentration of 0.1mg per liter. Exposure of the public to rotenone in this project can be eliminated because the water bodies that will be treated are on private land and there will be no water running out of the reservoir for an extended period of time.

With respect to long-term exposure to rotenone, there is probably no significant risk to humans because of the low concentrations at which it is applied (100 ug/L) and the fact that it degrades so quickly. The EPA (1997) has determined that the safe level for chronic (lifetime) exposure to rotenone for a child is 40 ug/L. Given the half-life of rotenone, it will then take less than 20 days for the applied concentration (0.1 mg/L) to drop below this level. Exposure to hazardous concentrations of rotenone for 50 days is a far shorter period of time than the EPA says is necessary to elicit chronic effects.

Fish will not be stocked into a treated area until all of the toxic effects are gone and rotenone has degraded. Stocked fish will not accumulate residues of rotenone from the water. Any fish that might survive the treatment won't pose a health threat because the bioaccumulation potential is low and the half-life of rotenone in fish is approximately 1 day (Gingerich and Rach 1985; Gingerich 1986).

USEPA has not established any guidelines for consuming fish killed with rotenone. Consumption of fish that have been dead for some time increases the risk of contracting salmonella or other bacteriological poisoning. However, fish that wash up on shore as a result of rotenone treatment and wave action are no more of a threat to public health than fish that die of natural causes.

The USEPA (1990) ruled that a reentry interval was not needed for persons who swim in waters treated with rotenone based on an assessment of the toxicology data (e.g., skin, oral water intake) and exposure level.

A commercial formulation of rotenone similar to that proposed for use in this project contains volatile organic compounds (xylene, trichloroethylene (TCE), toluene, and trimethylbenzene), and semi-volatile organic compounds (naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene). The organic compounds disappear before rotenone dissipates, typically within 1-3 weeks (Finlayson et al. 2000). The volatile organic compounds don't accumulate in the sediment; naphthalene and methyl naphthalene accumulate temporarily in the sediments (CDFG 1994; Siepmann and Finlayson 1999). TCE (a carcinogen) concentrations are expected to be within drinking water standard levels immediately following treatment. As a result of treatment, other materials will not exceed water quality criteria or guidelines set by the USEPA (1980a, 1981a, 1993). Many of the chemicals in liquid rotenone formulations are the same present in fuel and are present in waters because of outboard motor use. None of these constituents will be present at levels that can be expected to have any effect on animal life.

HUMAN ENVIRONMENT (continued)

9. <u>COMMUNITY IMPACT</u> Will the proposed action result in:	IMPACT*				Can Impact Be Mitigated*	Comment Index
	Unknown*	None	Minor*	Potentially Significant*		
a. Alteration of the location, distribution, density, or growth rate of the human population of an area?		X				
b. Alteration of the social structure of a community?		X				
c. Alteration of the level or distribution of employment or community or personal income?		X				
d. Changes in industrial or commercial activity?		X				
e. Increased traffic hazards or effects on existing transportation facilities or patterns of movement of people and goods?		X				
f. Other:						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

HUMAN ENVIRONMENT (continued)

10. <u>PUBLIC SERVICES/TAXES/UTILITIES</u> Will the proposed action result in:	IMPACT*				Can Impact Be Mitigated*	Comment Index
	Unknown*	None	Minor*	Potentially Significant*		
a. Have an effect upon or result in a need for new or altered governmental services in any of the following areas: fire or police protection, schools, parks/recreational facilities, roads, or other public maintenance, water supply, sewer or septic systems, solid waste disposal, health, or other governmental services? If any, specify:		X				
b. Have an effect upon the local or state tax base and revenues?		X				
c. Result in a need for new facilities or substantial alterations of any of the following utilities: electric power, natural gas, other fuel supply or distribution systems, or communications?		X				
d. Result in increased used of any energy source?		X				
e. Project will be funded by MFWP		X				10e

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

10e. This proposed project would be funded through Montana Fish, Wildlife and Parks. Preliminary cost estimates of the toxicant is \$1,200.

HUMAN ENVIRONMENT (continued)

11. <u>AESTHETICS/RECREATION</u> Will the proposed action result in:	IMPACT*				Can Impact Be Mitigated*	Comment Index
	Unknown*	None	Minor*	Potentially Significant*		
a. Alteration of any scenic vista or creation of an aesthetically offensive site or effect that is open to public view?		X				
b. Alteration of the aesthetic character of a community or neighborhood?		X				
c. Alteration of the quality or quantity of recreational/tourism opportunities and settings? (Attach Tourism Report)		X				
d. Other:		X				

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Land Resources (Attach additional pages of narrative if needed):

HUMAN ENVIRONMENT (continued)

12. <u>CULTURAL/HISTORICAL RESOURCES</u> Will the proposed action result in:	IMPACT				Can Impacts Be Mitigated*	Comment Index
	Unknown*	None	Minor*	Potentially Significant*		
a. Destruction or alteration of any site, structure, or object of prehistoric, historic, or paleontological importance?		X				
b. Physical change that would affect unique cultural or historic values?		X				
c. Effects on existing religious or sacred uses of a site or area?		X				
d. Other:						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Cultural/Historical Resources (Attach additional pages of narrative if needed):

SIGNIFICANCE CRITERIA

13. SUMMARY EVALUATION OF SIGNIFICANCE

Will the proposed action, considered as a whole:

	IMPACT				Can Impacts Be Mitigated*	Comment Index
	Unknown*	None	Minor*	Potentially Significant*		
a. Have impacts that are individually limited, but cumulatively considerable? (A project or program may result in impacts on two or more separate resources which create a significant effect when considered together or in total.)		X				
b. Involve potential risks or adverse effects which are uncertain but extremely hazardous if they were to occur?		X				
c. Potentially conflict with the substantive requirements of any local, state, or federal law, regulation, standard or formal plan?		X				
d. Establish a precedent or likelihood that future actions with significant environmental impacts will be proposed?		X				
e. Generate substantial debate or controversy about the nature of the impacts that would be created?			X			13e
f. Other:						

Narrative Description and Evaluation of the Cumulative and Secondary Effects on Cultural/Historical Resources (Attach additional pages of narrative if needed):

13e. We do not expect this project to generate substantial controversy. However, other recently proposed projects generated substantial controversy over the use of fish toxicants to remove nonnative trout. To mitigate the potential controversy associated with the use of fish toxicants or any other aspect of this project, FWP will inform the landowner as much as possible prior to treating any water.

Literature citations available by request.

PART II. ENVIRONMENTAL REVIEW

1. Description and analysis of reasonable alternatives (including the no action alternative) to the proposed action whenever alternatives are reasonably available and prudent to consider, and a discussion of how the alternatives would be implemented: The proposed action is designed to remove one of two known brown trout populations in the entire Flathead Drainage above Kerr Dam. Chemical toxicant use is a successful means of completely removing fish populations and a step in reducing and/or eliminating the threat of brown trout establishment in the Flathead. Another alternative would be some type of mechanical removal such as gillnetting. It would be very difficult and time-consuming to attempt complete removal with nets and the likelihood of success would be low. Catching the smallest fish with nets would not be possible, thus netting would need to be continued for over a generation, potentially 6 to 10 years. This alternative would not allow the landowner to reestablish a legal fish population for at least 6 to 10 years. The final, and least favorable, alternative would be to not conduct any management on the brown trout populations. It is important to note that this alternative would risk contaminating the Flathead Drainage with nonnative brown trout. This project is believed to be paramount in preserving the integrity of native trout in the Flathead drainage.

2. Evaluation and listing of mitigation, stipulation, or other control measures enforceable by the agency or another government agency: None.

3. Based on the significance criteria evaluated in this EA, is an EIS required? YES / NO If an EIS is not required, explain why the EA is the appropriate level of analysis for this proposed action: Adverse impacts are temporary and can be mitigated for. The proposed project is small in scale and completely on private property.

4. Describe the level of public involvement for this project, if any; and, given the complexity and the seriousness of the environmental issues associated with the proposed action, is the level of public involvement appropriate under the circumstances: Public comment will be solicited via newspaper releases and distribution of the draft EA to interested parties in the area.

5. Duration of comment period if any: Thirty days – June 15 through July 15, 2001.

6. Name, title, address and phone number of the person(s) responsible for preparing the EA: Mark Deleray, Fisheries Biologist, MT Fish, Wildlife & Parks, 490 N Meridian Road, Kalispell, MT 59901, (406) 751-4543, or e-mail to shjohnston@state.mt.us.

PART III. NARRATIVE EVALUATION AND COMMENT

2b. The petroleum-based carrier in the toxicant has an odor. Following application, this odor will be detectable in the near vicinity. It will dissipate in a matter of days.

3a. There are no inlets or outlets from the ponds. This will eliminate any potential for the rotenone-treated water from being released into other surface waters.

The concentration of rotenone (2ppm of a 5% rotenone formulation, or 0.1 ppm rotenone) which will be used in this project will not be harmful to plants, most invertebrate populations, adult amphibians, reptiles, birds, or mammals, including humans, from exposure to treated water, drinking of treated water, or ingestion of treated fish.

Rotenone is a naturally occurring substance derived from the roots of several tropical and subtropical plants in the bean family, Leguminosae, including jewel vine or Flame tree (*Derris* spp.) and lacepod (*Lonchocarpus* spp.) or hoary pea (*Tephrosia* spp.) (Finlayson et al. 2000). We plan to use a liquid formulation that was extracted from the roots. Rotenone inhibits a biochemical process at the cellular level, which makes it impossible for the fish to use oxygen absorbed in the blood and needed in the release of energy during respiration (Oberg 1967a, 1967b).

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To reduce the potential risks associated with the use of rotenone, the following mitigation measures and monitoring efforts will be employed:

4. Project personnel will be trained in the use of these chemicals including the actions necessary to deal with spills; personnel will wear rubber gloves and safety goggles.
5. Only the amount of rotenone that is needed for immediate use will be held near the ponds.
3. Prior to the use of rotenone, local landowners will be notified.

3f. Changes in groundwater quality: The risk that rotenone will enter and be mobile in groundwater is minimal. Rotenone's ability to move through soil is low to slight (Finlayson et al. 2000). Rotenone moves less than 1 inch in most types of soils, except for sandy soils where the movement is slightly more than 3 inches. Rotenone is strongly bound to organic matter in soil, so it is unlikely that rotenone would enter the groundwater (Dawson et al. 1991). Rotenone can be found in lake sediments at similar concentrations as in water; its breakdown lags behind that of water by 1-2 weeks (Finlayson et al. 2000). However, even if groundwater contamination could occur, there would be a low potential for detrimental effects on human health, since the surface water concentrations to be used in this project have been shown to have no toxic effect on humans or other animals (see 8a). Furthermore, any rotenone that enters groundwater will continue to be diluted by water already present in the aquifer.

3i. Effects on other water users: Bioassays on mammals suggest that at the proposed concentrations of rotenone that will be used, it would have no effect on mammals that drink the treated water. There is no reason to restrict the use of rotenone in waters intended for irrigation, livestock consumption (except possibly for swine), and recreational swimming use (USEPA 1981b). Although the studies required for setting tolerances have been completed, the USEPA has not established tolerances for rotenone in potable and irrigation water. As a result, although waters with rotenone present may not cause problems, water containing residues of rotenone cannot be legally allowed for use for domestic or crop use. The degradation process can vary from 1-8 weeks depending on initial concentrations, temperature, and water chemistry. This is not a concern since the ponds are not used for domestic purposes or livestock. Also, the waters have no direct public access.

There will be a temporary loss of fishery during rehabilitation period. Owner will be allowed to restock ponds following completion of and compliance with proper permitting within months of treatment.

5b. This proposed action is intended to result in removal of nonnative brown and rainbow trout from three small ponds. The project's goal is to increase the security of native trout in the drainage.

5c. Rotenone has a minimal impact on nontarget species. Rotenone has some toxicity to all oxygen-breathing animals, but at the

concentrations we will use, it is selective to fish and gill-breathing organisms. Most common aquatic invertebrates are less sensitive to rotenone than fish. Some zooplankton, such as cladocerans and copepods are just as sensitive as fish, but have life history stages that will survive the treatment. The effect on invertebrates may include a temporary decrease in populations of certain taxa. Snails and clams are tolerant. All animals, including fish, insects, birds, and mammals have natural enzymes in the digestive tract that neutralize rotenone, and the gastrointestinal absorption is inefficient. Fish, some amphibians, and aquatic invertebrates are more susceptible because rotenone is absorbed directly into their blood through their gills, bypassing the digestive enzymes that would neutralize it. Rotenone residues in dead fish are generally very low, <0.1 ppm, unstable like those in water, and not readily absorbed through the gut of the animal eating the fish. Birds and mammals that eat the dead fish and drink treated water should not be affected. A bird weighing 0.25 pounds would have to consume 100 quarts of water or more than 40 pounds of fish within 24 hours to receive a lethal dose. The 0.25-pound bird normally consumes 0.2 ounces of water and 0.32 ounces of food daily; a safety factor of 1,000 to 10,000-fold exists for birds and mammals (Finlayson et al. 2000). No latent or continuing toxicity is expected for more than a few weeks (CDFG 1994). Livestock are subjected to low risks as a result of this proposal. Rotenone was used for many years to control grubs on the backs of dairy and beef cattle. The USEPA (1981b) has stated that there is no need to restrict livestock consumption of treated waters. However, swine are more sensitive than cattle (Thompson 1985). Most dead fish will sink to the bottom of the treated water in several days, decompose, and release nutrients back into the water. The nutrients will enhance phytoplankton and insect and zooplankton production, which provide the food base for fish planted in the future.

8a. Substantial research has been conducted to determine the safety of rotenone. From this research it has been concluded that rotenone does not cause birth defects (Hazleton Raltech Laboratories 1982), reproductive dysfunction (Spencer and Sing 1982), gene mutation (Biotech Research 1981; Geothem et al. 1981; NAS 1983), or cancer (USEPA 1981b, Tisdell 1985). When used according to label instructions for the control of fish, rotenone poses little, if any, hazard to public health. The USEPA (1981b, 1989b) has concluded that the use of rotenone for fish control does not present a risk of unreasonable adverse effects to humans and the environment.

The hazard associated with the short-term exposure to drinking water containing rotenone is very small because of the low concentration of rotenone (0.1 ppm) used in the treatment and the rapid breakdown and dilution of rotenone. Estimates of a single lethal dose to humans are 300-500 mg of rotenone per kilogram (2.2 pounds) of body weight (Gleason et al. 1969). For example, a 160 pound (72.6 kilogram) person would have to drink over 23,000 gallons (87,000 liters) of water treated at 0.25 mg of rotenone per liter of water at one sitting; 0.25 mg of rotenone per liter of water is the highest allowable treatment rate for fish management. A 22 pound (10 kilogram) child would have to drink over 1,429 gallons (5,400 liters). An intake of 0.7 mg of rotenone per kilogram of body weight per day is considered safe (Haley 1978), which is equivalent to about 25 mg/L when consumed as drinking water; this concentration is far greater than the expected exposure resulting from the maximum fish management treatment rate of 0.25 mg of rotenone per liter of water or our proposed concentration of 0.1 mg per liter. Exposure of the public to rotenone in this project can be eliminated because the water bodies that will be treated are on private land and there will be no water running out of the reservoir for an extended period of time.

With respect to long-term exposure to rotenone, there is probably no significant risk to humans because of the low concentrations at which it is applied (100 ug/L) and the fact that it degrades so quickly. The EPA (1997) has determined that the safe level for chronic (lifetime) exposure to rotenone for a child is 40 ug/L. Given the half-life of rotenone, it will then take less than 20 days for the applied concentration (0.1 mg/L) to drop below this level. Exposure to hazardous concentrations of rotenone for 50 days is a far shorter period of time than the EPA says is necessary to elicit chronic effects.

Fish will not be stocked into a treated area until all of the toxic effects are gone and rotenone has degraded. Stocked fish will not accumulate residues of rotenone from the water. Any fish that might survive the treatment won't pose a health threat because the bioaccumulation potential is low and the half-life of rotenone in fish is approximately 1 day (Gingerich and Rach 1985; Gingerich 1986).

USEPA has not established any guidelines for consuming fish killed with rotenone. Consumption of fish that have been dead for some time increases the risk of contracting salmonella or other bacteriological poisoning. However, fish that wash up on shore as a result of rotenone treatment and wave action are no more of a threat to public health than fish that die of natural causes.

The USEPA (1990) ruled that a reentry interval was not needed for persons who swim in waters treated with rotenone based on an assessment of the toxicology data (e.g., skin, oral water intake) and exposure level.

A commercial formulation of rotenone similar to that proposed for use in this project contains volatile organic compounds (xylene, trichlorethylene (TCE), toluene, and trimethylbenzene), and semi-volatile organic compounds (naphthalene, 1-methyl naphthalene and 2-methyl naphthalene). The organic compounds disappear before rotenone dissipates, typically within 1-3 weeks (Finlayson et al. 2000). The volatile organic compounds don't accumulate in the sediment; naphthalene and methyl naphthalene accumulate temporarily in the sediments (CDFG 1994; Siepmann and Finlayson 1999). TCE (a carcinogen) concentrations are expected to

within drinking water standard levels immediately following treatment. As a result of treatment, other materials will not exceed water quality criteria or guidelines set by the USEPA (1980a, 1981a, 1993). Many of the chemicals in liquid rotenone formulations are the same present in fuel and are present in waters because of outboard motor use. None of these constituents will be present at levels that can be expected to have any effect on animal life.

10e: This proposed project would be funded through Montana Fish, Wildlife and Parks. Preliminary cost estimates of the toxicant is \$1,200.

13e. We do not expect this project to generate substantial controversy. However, other recently proposed projects generated substantial controversy over the use of fish toxicants to remove nonnative trout. To mitigate the potential controversy associated with the use of fish toxicants or any other aspect of this project, FWP will inform the landowner as much as possible prior to treating any water.

PART IV. EA CONCLUSION SECTION

Brown trout pose a serious threat to native trout in the Flathead Drainage. Given that alternative eradication methods are unlikely to be successful at completely removing the brown trout populations from the ponds, it is believed that chemical rehabilitation is the final solution.

After implementing previous methods and weighing the potential impacts to a no action alternative, FWP recommends implementing the final solution: chemical rehabilitation with the use of Rotenone. This project is believed to be fundamental in safeguarding the native trout in the Flathead Drainage.

